Amendments to the Claims

This listing of claims will replace all prior versions and listings of the claims in the application:

Listing of Claims:

Claims 1-23 (canceled)

24. (currently amended) A system for determining the instantaneous amplitude (a) and phase (ϕ) of an analog ~~sinusoid~~ sinusoidal signal comprising:

a vibratory sensor which produces said analog ~~sinusoid~~ sinusoidal signal output in response to the measurement of a parameter;

an analog-to-digital converter which receives said analog ~~sinusoid~~ sinusoidal signal from the sensor and converts said analog ~~sinusoid~~ sinusoidal signal to a digital ~~sinusoid~~ sinusoidal signal to form the in-phase component (I) of said ~~sinusoid~~ sinusoidal signal;

a Hilbert transformer approximation device which receives said digital ~~sinusoid~~ sinusoidal signal and produces the quadrature component (Q) of said digital ~~sinusoid~~ sinusoidal signal by introducing a phase shift to said digital ~~sinusoid~~ sinusoidal signal; and

a Coordinate Rotation Digital Computer (CORDIC) comprising:

an amplitude computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous amplitude (a) of said digital ~~sinusoid~~ sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the equation $a = \sqrt{(Q^2 + I^2)}$; and

a phase computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous phase (ϕ) of said digital ~~sinusoid~~ sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the

equation $\phi = \tan^{-1}(Q/I)$.

25. (original) The system of claim 24 wherein said Hilbert transformer approximation device further introduces a predetermined delay into said quadrature component (Q).

26. (original) The system of claim 25 further comprising a delay device which introduces said predetermined delay into said in-phase component (I).

Claims 27-35 (canceled)

36. (currently amended) A method of determining the amplitude (a) and phase (ϕ) of ~~a sinusoid~~ an analog sinusoidal signal comprising:

A. measuring a parameter of an object with a vibratory sensor;

B. generating ~~an~~ said analog ~~sinusoid~~ sinusoidal signal representative of said parameter;

C. digitizing said analog ~~sinusoid~~ sinusoidal signal to produce a digital ~~sinusoid~~ sinusoidal signal;

D. filtering said digital ~~sinusoid~~ sinusoidal signal to attenuate out-of-band noise in said digital ~~sinusoid~~ sinusoidal signal;

E. introducing a delay into said digital ~~sinusoid~~ sinusoidal signal to produce an in-phase signal (I) associated with said digital ~~sinusoid~~ sinusoidal signal;

F. performing a Hilbert transform approximation of said digital ~~sinusoid~~ sinusoidal signal to introduce a phase shift plus the delay into said digital ~~sinusoid~~ sinusoidal signal, thereby producing a quadrature signal (Q) associated with said digital ~~sinusoid~~ sinusoidal signal;

G. processing, with a Coordinate Rotation Digital Computer (CORDIC), said in-phase (I) and quadrature (Q) signals to compute said amplitude (a) of said digital ~~sinusoid~~ sinusoidal signal according to the equation $a = \sqrt{(Q^2 + I^2)}$; and

H. processing, with said CORDIC, said in-phase (I) and quadrature (Q) signals to compute said phase (ϕ) of said digital ~~sinusoid~~ sinusoidal signal according to the equation $\phi = \tan^{-1}(Q/I)$.

37. (Previously presented) The method of claim 36 wherein said vibratory sensor comprises one of an accelerometer, a gyroscope, and a microphone.

Claims 38-40 (canceled)

41. (Currently amended) A system for determining ~~the~~ an instantaneous amplitude (a) and phase (ϕ) of an output analog sinusoidal signal comprising:

a vibratory sensor which produces said output analog sinusoidal signal characterized by ~~an~~ the instantaneous phase and amplitude in response to the measurement of a parameter;

an analog-to-digital converter which receives said output analog sinusoidal signal from the vibratory sensor and converts said output analog sinusoidal signal to a digital ~~sinusoid~~ sinusoidal signal to form the in-phase component (I) of said ~~sinusoid~~ sinusoidal signal;

a Hilbert transformer approximation device which receives said digital ~~sinusoid~~ sinusoidal signal and produces the quadrature component (Q) of said digital ~~sinusoid~~ sinusoidal signal by introducing a phase shift to said digital ~~sinusoid~~ sinusoidal signal; and

a Coordinate Rotation Digital Computer (CORDIC) comprising:

an amplitude computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous amplitude (a) of said digital ~~sinusoid~~ sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the equation $a = \sqrt{(Q^2 + I^2)}$; and

a phase computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous phase (ϕ) of said digital ~~sinusoid~~ sinusoidal signal

by processing said in-phase (I) and quadrature (Q) components according to the equation $\phi = \tan^{-1}(Q/I)$.

42. (Currently amended) A method of determining ~~the~~ an amplitude (a) and phase (ϕ) of ~~a sinusoid~~ an analog sinusoidal signal comprising:

A. measuring a parameter of an object with a vibratory sensor;

B. generating an output analog sinusoidal signal characterized by ~~an~~ the instantaneous phase and amplitude representative of said parameter;

C. digitizing said output analog sinusoidal signal to produce a digital ~~sinusoid~~ sinusoidal signal;

D. filtering said digital ~~sinusoid~~ sinusoidal signal to attenuate out-of-band noise in said digital ~~sinusoid~~ sinusoidal signal;

E. introducing a delay into said digital ~~sinusoid~~ sinusoidal signal to produce an in-phase signal (I) associated with said digital ~~sinusoid~~ sinusoidal signal;

F. performing a Hilbert transform approximation of said digital ~~sinusoid~~ sinusoidal signal to introduce a phase shift plus the delay into said digital ~~sinusoid~~ sinusoidal signal, thereby producing a quadrature signal (Q) associated with said digital ~~sinusoid~~ sinusoidal signal;

G. processing, with a Coordinate Rotation Digital Computer (CORDIC), said in-phase (I) and quadrature (Q) signals to compute said amplitude (a) of said digital ~~sinusoid~~ sinusoidal signal by applying the equation $a = \sqrt{(Q^2 + I^2)}$; and

H. processing said in-phase (I) and quadrature (Q) signals to compute said phase (ϕ) of said digital ~~sinusoid~~ sinusoidal signal by applying the equation $\phi = \tan^{-1}(Q/I)$.